



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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<p><b>(54) Title:</b> REFURBISHMENT OF FIBREGLASS PANELS</p> <p><b>(57) Abstract</b></p> <p>A method of refurbishing a shipping container having an inner fibreglass lining that has a plurality of spaced apart outwardly projecting portions which form battens or ribs in the interior of the container which includes the step of substantially removing the projections so as to provide a substantially planar surface of the lining. A replacement panel having a plurality of spaced apart outwardly projecting portions is formed in a mould using a gelcoat having from 2 to 75% flexible resin and a fibreglass backing of from 225 to 3,000 grams per square metre. An adhesive is then applied to the planar surface and the formed panel is pressed onto the adhesive so that the spaced apart portions project into the interior of the container.</p>			

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REFURBISHMENT OF FIBREGLASS PANELSFIELD OF INVENTION

This invention relates to the refurbishment of fibreglass panels.

5 For the sake of convenience, the invention will be described in relation to the refurbishment of the fibreglass linings of shipping containers, but, it is to be understood that the invention is not limited thereto.

BACKGROUND ART

10 The fibreglass lining of a shipping container is normally adhered to a timber panel which is usually in the form of treated plywood or sandwiched timber skins. The complete inner panel consisting of the fibreglass and timber plywood is then adhered to a polyurethane insulation portion  
15 on the inside of the walls of the container.

The fibreglass portion of the inner panel usually consist of a planar base portion having a plurality of spaced apart outwardly projecting portions which form batons or ribs that project into the interior of the container.

20 Over a period of use, the fibreglass lining crazes or cracks and becomes unsuitable for use as the cracks can harbour harmful bacteria. This presents a threatening health problem especially in the transportation of consumable goods.

It is difficult to remove a damaged fibreglass lining as

it is securely glued to the polyurethane insulation.

Furthermore, the wide variety of rib patterns in use generally prohibits use of preformed overlay panels.

It is an object of the present invention to provide an improved method of refurbishing fibreglass lining walls of shipping containers in which the original panel is not wholly removed from the insulation and which readily takes account of the wide variety of rib patterns in use.

#### DISCLOSURE OF INVENTION

According to the invention there is provided a method of refurbishing a fibreglass panel having a base portion and plurality of spaced apart outwardly projecting portions, said method comprising the steps of:

- (i) removing, or substantially removing, the projections so as to provide a substantially planar surface on the fibreglass panel,
- (ii) applying an adhesive to the substantially planar surface, and,
- (iii) positioning a replacement panel having a plurality of preformed spaced apart outwardly projecting portions onto the adhesive.

A preferred adhesive is a vinyl ester resin incorporating a filler and chopped fibreglass strands.

Other adhesives which may be used in cases where different conditions of the fibreglass surfaces are present include:

(i) orthophthalic, isophthalic, neopentylglycol or a combination of any of these three additive based polyester resins,

(ii) epoxy resins,

5 (iii) silicone

With either of the above resins, fillers need not be used if low viscosity of the resin is required. In some fibreglass depositor systems, lower viscosity resin is mixed with the catalyst (internally or externally) and to that mixture is added chopped fibreglass strands which come in contact with the fibreglass surface.

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#### DESCRIPTION OF PREFERRED EMBODIMENTS

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According to one embodiment of the invention, the projecting portions of the fibreglass lining wall of the shipping container are removed by a diamond saw to give a substantially flat surface. Although it is preferable to remove the projecting portions in such a manner to provide a flat surface, it will be appreciated that small projections may remain or overcuts may be made.

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The replacement panel is separately formed in a mould using a neopentylglycolisophthalic based gelcoat having from 2 to 75% flexible resin added which is then backed by 225 to 3000 grams per square meter of fibreglass wetted with a neopentylglycolisophthalic or isophthalic resin binder. The 25 fibreglass can be in the form of a mat, continuous rovings or a sheet moulding compound. Various weights are used to meet

the different specifications and requirements of fibreglass linings of containers.

5       The adhesive is either sprayed or screened in a pattern onto the substantially planar surface of the inner wall of the container. In the case of the vinyl ester resin adhesive, the thickness can be approximately 6mm. The preformed replacement panel is pressed against the adhesive on the insulation until the adhesive is compressed to approximately 2mm in order to achieve a proper bond.

10       In cases where there air vents or cooling port holes in parts of containers as well as in difficult to reach areas, the refurbishment can be achieved using split strand mats and a resin binder. The surface is then finished with compatible fibreglass surface tissue. Pigmented resin or  
15       neopentylglycolisophthalic gelcoat with 0.5 to 20% wax and styrene monomer added can be used to provide the required colour and waxed surface.

20       Various modifications may be made in details of the process and the composition of materials used therein without departing from the scope and ambit of the invention.

CLAIMS

1. A method of refurbishing a fibreglass panel having a base and plurality of spaced apart outwardly projecting portions, said method comprising the steps of:
  - (i) removing, or substantially removing, the projections so as to provide a substantially planar surface on the fibreglass panel,
  - (ii) applying an adhesive to the substantially planar surface, and,
  - (iii) positioning a replacement panel having a plurality of spaced apart outwardly projecting portions onto the adhesive.
2. A method according to claim 1 wherein the adhesive is a vinyl ester resin incorporating a filler and chopped fibreglass strands.
3. A method according to claim 1 wherein the adhesive is selected from the group comprising:-
  - (i) orthophthalic, isophthalic or neopentylglycol additive based polyester resins or any combination thereof,
  - (ii) epoxy resins
  - (iii) silicone
4. A method according to any one of the preceding claims wherein the replacement panel is formed in a mould using a neopentylglycol isophthalic based gelcoat having from 2 to

75% flexible resin added thereto and a backing of from 225 to 3,000 grams per square meter of fibreglass.

5. A method according to claim 4 wherein the fibreglass is in the form of a mat, continuous rovings or a continuous sheet moulding compound.

6. A method of refurbishing a shipping container having an inner fibreglass lining that has a plurality of spaced apart outwardly projecting portions which form batons or ribs in the interior of the container, said method comprising the steps of:-

- (i) substantially removing the projections so as to provide a substantially planar surface on the fibreglass lining,
- (ii) forming a replacement panel having a plurality of spaced apart outwardly projecting portions in a mould using a gelcoat having from 2 to 75% flexible resin and a fibreglass backing of from 225 to 3,000 grams per square metre,
- (iii) applying an adhesive to the planar surface and pressing the formed panel onto the adhesive with the spaced apart portions projecting into the interior of the container.

## INTERNATIONAL SEARCH REPORT

International Application No PCT/AU 86/00389

## I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) \*

According to International Patent Classification (IPC) or to both National Classification and IPC  
 Int. Cl. 4 B32B 35/00, C08J 5/12

## II. FIELDS SEARCHED

Minimum Documentation Searched ?

Classification System	Classification Symbols
IPC	B32B 35/00, C08J 5/12

Documentation Searched other than Minimum Documentation  
 to the Extent that such Documents are Included in the Fields Searched \*

AU; IPC as above

## III. DOCUMENTS CONSIDERED TO BE RELEVANT\*

Category *	Citation of Document, ** with indication, where appropriate, of the relevant passages ***	Relevant to Claim No. 13
A	DE,A, 2758892 (CONTRANS GESELLSCHAFT FUR CONTAINERVERKEHR mbH) 5 July 1979 (05.07.79)	
A	GB,A, 2131741 (JENKINS) 27 June 1984 (27.06.84)	
A	US,A, 4430133 (GRIFFITH) 7 February 1984 (07.02.84)	
A	GB,A, 1503027 (ITAL-RUBBER SRL) 8 March 1978 (08.03.78)	

## \* Special categories of cited documents: 10

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## IV. CERTIFICATION

Date of the Actual Completion of the International Search

9 April 1987 (09.04.87)

Date of Mailing of this International Search Report

14.4.87 (14 APRIL 1987)

International Searching Authority

Australian Patent Office

Signature of Authorized Officer

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ANNEX TO THE INTERNATIONAL SEARCH REPORT ON  
INTERNATIONAL APPLICATION NO. PCT/AU 86/00389

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report		Patent Family Members			
GB	1503027	AR	206369	AT	9398/75
		BR	7508773	CA	1078120
		DE	2553975	ES	445860
		IL	48815	IT	1028591
		NL	7515035	SE	7513550
					AU 10097/76
					CH 591947
					FR 2298429
					JP 51093982
					SU 938734

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